REMARKS

Claims 15-27 are presently pending in the application and are presently variously rejected under 35 U.S.C. § 112 and under 35 U.S.C. § 102 and 35 U.S.C. § 103 over McKenzie et al. `979.

The Examiner objects to the drawings, and in particular to Fig. 1, for the lack of labels in diagram boxes 1 and 3 of Fig. 1, and to the specification on page 2, line 5 for misspelling "of" as "fo".

First considering the Examiner's objections to the drawings and specification, the Applicant herein above amended Fig. 1 to provide labels for diagram boxes 1 and 3 of Fig. 1 and amended the specification at page 2, line 5 to correct "fo" to "of".

The amendments to the drawings and specification thereby address and overcome the Examiner's stated grounds for objection to the drawings and specification and the Applicant, therefore, respectfully requests that the Examiner reconsider and withdraw the objections to the drawings and specification. New formal drawings, incorporating the requested amendments, will follow once the requested drawing amendments are approved by the Examiner. If any further amendment to the drawings of this application is believed necessary, the Examiner is invited to contact the undersigned representative of the Applicant to discuss the same.

Turning now to the Examiner's rejections of claims 22-27 under 35 U.S.C. § 112, second paragraph, as being indefinite for the reasons noted in the official action wherein claims 23-27 are each dependent from claim 11. In particular, the Examiner rejects claim 22 under 35 U.S.C. § 112 for lack of support for the limitation of a stationary torque-transmitting hub located between the transmission output shaft and a fixed part of the test bench and questions support in the specification regarding the torque transmitting hub, the location of the torque transmitting hub, and the disclosure of a fixed part of the test bench. The Examiner also points out that the limitation "torque measuring hub" in claim 26 lacks sufficient antecedent basis.

In response, the Applicant is unsure if the Examiner's rejection of claim 22, and thus of claims 23-27, is based upon the recited limitation "of a torque transmitting hub" rather than the correct recitation of this limitation as "of a torque measuring hub", or if the Examiner is questioning the support in the specification of the entire limitation of a stationary torque-transmitting hub located between the transmission output shaft and a fixed part of the test bench.

In response, however, the Applicant will address both issues. First, it will be noted that the Applicant amended claim 22 to recite a "torque measuring hub" rather than a "torque transmitting hub", which also provides necessary antecedent basis for the recitation of "the torque measuring hub" in claim 26.

Further in this regard, it should also be noted that paragraph [023] repeats this description, but contains an error in that the recitation of a "torque transmitting hub" in paragraph [023] should instead be a "torque measuring hub", in accordance with the remainder of the specification, and that paragraph [023] of the specification is accordingly amended above. It should be noted that this error came about when the specification was amended by the inclusion of subject matter from the claims into the specification in the Response After Final when the Request for Continued Examination was filed in the present application. That amendment thereby carried into the specification certain errors that were then present in the claims, and that were since amended above. It should also be noted that as discussed in the Response After Final, this amendment did not add any new matter to the present application as all claims as originally filed are considered part of the specification for purposes of disclosure and description of the invention under the requirements and provisions of 35 U.S.C. § 112.

Secondly, and with regard to support in the specification for the above discussed claim limitations, it must be noted that paragraphs [018] and [023] and Fig. 1 of the specification

explicitly describe that the transmission to be tested is "upon a testing stand" and that the output shaft of the transmission is connected to a "stationary torque measuring hub".

It is, therefore, the belief and position of the Applicant that the present specification includes full support in paragraphs [018] and [023] and in Fig. 1 for the claim limitations reciting that the transmission to be tested is upon a testing stand and that the output shaft of the transmission is connected to a stationary torque measuring hub.

Next considering whether the specification contains sufficient support for the recited limitations that the stationary torque measuring hub is located between the transmission output shaft and a fixed part of the test bench and the recited limitation that the torque measuring hub is mounted to a fixed part of the test bench, or, for that matter, that the test bench has a fixed part.

In response, the Applicant would again like to refer the Examiner to Fig. 1 and the corresponding descriptions in paragraphs [018] and [023] wherein it is specifically described that the transmission to be tested is "upon a testing stand" and that the output shaft of the transmission is connected to a "stationary torque measuring hub" connected to "the output shaft of the transmission". This description is further supported by Fig. 1 wherein stationary torque measuring hub 5 is shown as being connected from output shaft 7 of automatic transmission 1 and to an element that is represented by diagonal lines on the right side of stationary torque measuring hub 5.

It will be apparent that because stationary torque measuring hub 5 is connected to the rotating output shaft 7 of the transmission 1 but is required to be stationary, as is explicitly described, it is necessary that the torque measuring hub 5 be attached to some stationary or fixed object or element, which is logically represented by the element represented by diagonal lines on the right side of the hub 5. It is further a logical conclusion, and fully supported by the relevant portions of the specification, that the element represented by diagonal lines is the "fixed part of the test bench" described in the specification and recited in the claims. It is noted,

however, that the "fixed part of the test bench", while explicitly and clearly described in the specification, is not specifically indicated as an element in Fig. 1 and is not identified in the specification or in Fig. 1 by a reference numeral.

In a closely related matter, the specification specifically and clearly states in paragraphs [018] and [023] that the transmission to be tested is "upon a testing stand". The "testing stand", however, while explicitly and clearly described in the specification, is not explicitly shown in Fig. 1 and is not identified by a corresponding reference numeral in either the specification or in Fig. 1.

In further response to the issues raised by the Examiner under 35 U.S.C. § 112, therefore, the Applicant respectfully submits the above further amendments to Fig. 1 and to paragraphs [018] and [023] of the specification to explicitly call out, show and identify with reference numerals the described "fixed part of the test bench" and the described "testing stand". As may be seen, these amendments to Fig. 1 expressly show and designate by a reference numeral both the "testing stand 10" with, in this instance, the addition of an element representing "testing stand 10" to Fig. 1, and the "fixed part of test bench 12", which is comprised of the element comprised of diagonal lines to the right of hub 5. Corresponding amendments are to paragraphs [018] and [023] are also submitted to bring the text of the specification in agreement with Fig. 1. It will also be noted that these amendments to Fig. 1 and to paragraphs [018] and [023] are fully supported by the specification, drawings and claims of the application as originally filed, such as original claim 1, the subject matter of which has since appeared in claims 8 and 15, so that no new matter has been added by way of these amendments and so that neither the scope nor the subject matter of the application and claims has been modified or extended in any way.

The Applicant respectfully requests that the Examiner approve and enter the above discussed amendments to the specification, drawings and claims. It is also be Applicant's belief and position that the above discussed amendments address and overcome all of the

Examiner's grounds for objection to or rejection of either the claims or the specification or drawings under 35 U.S.C. § 112. The Applicant respectfully requests that the Examiner reconsider and withdraw all rejections or objections under 35 U.S.C. § 112, and allowance of the application as amended herein above.

Next considering the Examiner's rejections of the claims over the cited prior art, claims 15-20 are rejected under 35 U.S.C. § 102(b) as being anticipated by McKenzie et al. `979 and claims 21-27 are rejected under 35 U.S.C. § 102 as unpatentable over McKenzie et al. `979. The Applicant acknowledges and respectfully traverses the raised anticipatory rejection in view of the following remarks. In the following the Applicant will address both rejections, that is, of claims 15-20 under 35 U.S.C. § 102 and of claims 21-27 under 35 U.S.C. § 103, concurrently to avoid repetitiveness as the distinctions between the present invention and the teachings of McKenzie et al. `979 are the same with respect to both rejections.

For example, the Applicant respectfully disagrees with the Examiner's interpretation of McKenzie et al. `979 in the rejection of claim 15 because, firstly, McKenzie et al. `979 does not teach a method of calibrating clutches in a transmission by simulating vehicle operation.

That is, in the present invention the operation of a vehicle is truly simulated in that the transmission is tested on a testing stand and is driven by a driving source that, because the transmission is mounted on a testing stand, is not and cannot be a vehicle or a vehicle power unit, so that the driving machine thereby truly simulates the input from a vehicle. In this regard, it should also be noted that the specification of the present application also states that the driving source is of lessor power than a conventional vehicle engine, so that the driving machine is not and cannot be a conventional vehicle engine. This feature therefore further supports the fact that in the present invention the transmission is mounted on a testing stand that simulates operation in a vehicle.

In contrast from the present invention, and as clearly described at, for example, column 3, lines 8 to 19 and lines 46 to 67, column 4, lines 9 to 22 and 46 to 67, column 5, line 54 to column 6, line 24 of McKenzie et al. `979, the McKenzie et al. `979 method employs an actual vehicle with the transmission mounted in and operating in the vehicle to test the transmission. The McKenzie et al. `979 method thereby does not and cannot mount the transmission on a testing stand and does not and cannot connect the transmission output to a fixed torque measuring device mounted on a fixed part of a test bench.

Further support for this distinction between the present invention and McKenzie et al. `979, and in further distinction between the present invention and McKenzie et al. `979, it is described and recited in the present application and claims thereof that the transmission output shaft is connected to a stationary or fixed torque measuring hub that simulates a vehicle power train, rather than to an actual vehicle power, and that blocks or locks-up the transmission output shaft.

In fundamental contrast from the method of the present invention, the transmission output of the McKenzie et al. `979 system is connected to an actual vehicle power train through an actual vehicle parking brake interposed between the output shaft and the power train, as in a conventional vehicle. In this regard, and in further distinction between McKenzie et al. `979 and the present invention, it must be noted that the McKenzie et al. `979 system locks-up or blocks the transmission output solely by application of the parking brake, rather than by means of a fixed torque measuring hub connected to the transmission output shaft. This is not only necessary in the McKenzie et al. `979 method, but cannot be done any other way because in the McKenzie et al. `979 method the transmission is operating in an actual vehicle with the transmission output shaft connected to the drive train so that there is no available point at which to insert a torque measuring hub and, as a result, no other way than the parking brake to lock-up the transmission output shaft.

In still further distinction between the present invention and the teachings of McKenzie et al. `979, the method of the present invention detects and measures torque output of the transmission by means of the fixed torque measuring hub connected between the transmission output shaft and a fixed part of the test bench. In fundamental contrast from the present invention, and as described at, for example, column 4, lines 9-23, the McKenzie et al. `979 method senses the behavior of the transmission solely by means of the conventional, standard speed sensors that are internal to the transmission and by selected other sensors connected, for example, to indicate the engine speed output.

This distinction is again mandated by the completely fundamental distinction between the present invention and the McKenzie et al. `979 method in that in the present invention the transmission is not in a vehicle and is not even connected to other vehicle components, but is instead mounted on a testing stand with the transmission output shaft connected to a torque measuring hub connected to a fixed part of a test bench. In contrast from the present invention, and as discussed herein above, the McKenzie et al. `979 method requires that the transmission to be tested be mounted and operating in a vehicle, that is, connected from a vehicle engine through a torque converter and having a transmission output shaft connected through a parking brake to the vehicle drive train. As such, and as also discussed herein above, the McKenzie et al. `979 method must employ already existing speed sensors in the transmission and cannot use any form of torque measuring hub connected from the transmission outshaft. This requirement is mandated because it is impossible to connect a torque measuring hub to a transmission output shaft when the transmission is mounted and operating in a vehicle and the output shaft is connected through a parking brake and to the drive train.

A yet further basic distinction between the present invention and the teachings of McKenzie et al. `979 is in the test methods themselves, including the test procedures,

the reason and purpose of the test procedures and the means by which the tests are controlled and performed.

By way of background, it is well understood that a hydraulically actuated automatic transmission is comprised of a plurality of shifting element that include gear elements providing different gear ratios and a plurality of clutch elements engaging and disengaging the gear element to provide the desired transmission gear ratio and direction. The shifting elements are in turn selectably and controllably engaged and disengaged by hydraulic pressures controlled by electric currents controlling valves.

According to the present invention, the effect of the engaging or disengaging of each transmission shifting element depends upon the type of shifting element and is indicated by a change in slip through the transmission when the shifting element begins to engage or disengage which, in turn, is reflected in the torque transmitted through the transmission. For example, the activation of a shifting element that is disengaged, or "open", when unactivated and that engages, or "closes", when activated will typically result in a decrease in transmission slip. That is, the slip will begin to decrease from some initial value when the shifting element first actually begins to engage and will tend towards zero as the degree of shifting element engagement increases. The activation of a shifting element that is engaged, that is, "closed", when the shifting element is unactivated and that disengages, or "opens", when the shifting element is activated will typically result in an increase in transmission slip. That is, the slip will begin to increase from some initial value when the clutch element first actually begins to engage and will increase toward some greater value as the degree of shifting element disengagement increases.

This operation is recited in the claims as a basic principle, such as in claims 15 and 22 by the statement "actuate the shifting elements out of an opened condition to the extent necessary to determine, indicate and store a desired shifting element characteristic", and more specifically in, for example, claims 16 and 23 by the statement "at which the shifting element

slips and a point at which the shifting element slip tends toward zero when the shifting element closes".

It must also be noted, in this regard, that the object of the present invention is to determine the control current levels corresponding to the control pressures at which the individual shifting elements begin to engage or disengage, that is, the current levels and control pressures at which the individual shifting elements are functionally actuated, or become functionally unactuated.

It is, therefore, apparent that there are yet further basic, fundamental distinctions between the present invention and the teachings of McKenzie et al. `979.

In a first fundamental distinction between the present invention and McKenzie et al. `979, McKenzie et al. `979 teaches that the transmission should be mounted in and connected into a vehicle and controlled by the electronic transmission controller of the vehicle, while the present invention teaches and claims that the transmission should not be in or connected into a vehicle, but should instead be mounted onto a testing stand and test bench.

The method of McKenzie et al. `979, however, not only teaches away from the present invention in testing a transmission in a vehicle rather than on a testing stand and test bench, but results in very fundamental differences between the method of the present invention and the method taught by McKenzie et al. `979. For example, in the method of the present invention the transmission is mounted on a testing stand and the tests are performed and controlled tests by a transmission test control unit so that each shifting element can be and is tested individually and independently of all other shifting elements of the transmission.

In fundamental contrast from the method of the present invention, McKenzie et al. `979 teaches that the transmission is to be tested in a vehicle and that the tests are controlled by the standard vehicle transmission control unit. This, in turn, means that the testor can select and initiate a test only on the basis of a shifting operation as seen by the driver of a vehicle. That is, the testor has access only to the standard transmission controls, such as a shift lever, and can

only tell the transmission control unit to shift, for example, from second gear to third gear or from forward to reverse. As is well known and understood, each such shifting operation will typically involve several shifting elements that will operate concurrently or in overlapping sequence to perform the indicated shifting operation. As such, it will be essentially impossible in the McKenzie et al. `979 method to test each shifting element individually and separately from the other shifting elements. Stated another way, in the McKenzie et al. `979 method it is possible to test only the combinations of shifting elements employed in the conventional shifting operations of the vehicle, rather than the individual shifting elements. In addition, and as a consequence of this limitation in the McKenzie et al. `979 method, the test of a given shifting operation will result only in data pertaining to a group of shifting elements and the test will not and cannot provide data pertaining to a single shifting element, which makes it difficult to determine any required adjustments for a given shifting element. Once again, McKenzie et al. `979 teaches directly away from and contrary to the present invention.

In yet another basic distinction between the present invention and the teachings of McKenzie et al. `979, the method of the present invention requires and executes only a single test step for each shifting element. In the single test step for a given shifting element, an activation control pressure is applied to the selected shifting element and is increased until the shifting element is activated, as indicated by a change in the transmission slip as represented by a change in the output torque of the transmission, at which point the control pressure and control current to the valve are noted and stored for later use. As described above, the activation of shifting element and the corresponding change in the transmission slip may be indicated by either the start of an increase in the slip from some initial value or the start of a change in the slip from some initial value due to the start of a trend in the slip towards zero slip.

In complete contrast from the method of the present invention, the method taught by McKenzie et al. `979 requires the performance of a sequence of test steps for each gear

shifting operation wherein, as described, as gear shifting operation typically involves the activation or deactivation of a group of shifting elements. In each such sequence, each test step requires a three stage application of a test pressure to the shifting elements involved in the selected gear shift operation and, for example, monitoring of the internal speed of the transmission by means of internal speed sensors to determine whether the clutches involved in the gear have reached the filled state. In this regard, it must be noted that the three stage application of test pressure in each test step involves an high level pressure pulse, that is, a rapid fill pulse, followed by a lower pressure filling pressure, followed finally by a return to zero pressure. The test steps of each sequence of test steps, and the three stages in each step, are repeated with increasing pressures until the clutch or clutches reach the filled state, with the pressures required to achieve the filled state comprising the sought for data regarding transmission performance.

McKenzie et al. `979, therefore, not only teaches an entirely different procedure for testing a transmission than does the present invention, but tests only groups of shifting elements that are defined by each given gear shift operation rather than individual shifting elements, thereby testing an entirely different mechanism than does the present invention.

It is apparent that McKenzie et al. `979 teaches an entirely different method of testing of a transmission than does the present invention, and uses entirely different testing means and an entirely different testing setup and to entirely different results for a basically different purposes than the present invention. McKenzie et al. `979 thereby teaches not only an entirely different testing method than does the present invention, but also effectively teaches directly away from and contrary to the present invention in essentially every aspect of both the present invention and the method taught by McKenzie et al. `979.

As regards the rejections of claims 15-20 are rejected under 35 U.S.C.§ 102, therefore, it is apparent that each of claims 15-20 contains recitations clearly and fundamentally distinguishing the present invention over the teachings of McKenzie et al. `979 under the

requirements and provisions of 35 U.S.C. § 102, either directly by the claim's own recitations or by incorporation by dependence from a parent claim.

For example, claims 15, 16 and 19 in particular contain the distinguishing recitations and limitations discussed above, and claims 17, 18 and 20 contain the same distinguishing recitations and limitation by incorporation by dependence from claim 15.

The distinguishing recitations of claims 15, 16 and 19, for example, thereby include the limitations indicated below in copies of claims 15, 16 and 19, as well as further limitations that are not discussed in detail herein.

It will also be noted that not only are the above indicated limitations reflected in claims 17, 18 and 20, but that the limitations of claim 15 are incorporated into claims 17, 18 and 20 by dependence from claim 15, so that claims 17, 18 and 20 are also distinguished over and from the teachings of McKenzie et al. `979 for the reasons discussed herein above.

It will, therefore, be apparent to those of ordinary skill in that art that McKenzie et al. `979 not only does not teach or even suggest the above discussed aspects and limitations of the present invention, but actually teaches away from the present invention in each aspect of the present invention and the prior art discussed above. It is the belief and position of the Applicant that claims 15-20 are thereby fully and patentably distinguished over and from the teachings and suggestions of McKenzie et al. `979 under the requirements and provisions of 35 U.S.C. § 102. The Applicant therefore respectfully requests that the Examiner reconsider and withdraw all rejections of claims 15-20 over McKenzie et al. `979 under 35 U.S.C. § 102, and the allowance of claims 15-20 as amended herein.

Next considering the rejections of claims 20-27 McKenzie et al. `979 under 35 U.S.C. § 103, it is apparent that each of claims 20-27 contains recitations clearly and fundamentally distinguishing the present invention over the teachings of McKenzie et al. `979 under the requirements and provisions of 35 U.S.C. § 103, either directly by the claim's own recitations or by incorporation by dependence from a parent claim.

It will also be noted that the limitations of claim 15 are incorporated into claims 20 and 21 and that the limitations of claim 22 are incorporated into claims 25 and 27 by their dependence from claim 22, so that these claims are also distinguished over and from the teachings of McKenzie et al. `979 for the reasons discussed herein above.

It will be apparent to those of ordinary skill in that art that McKenzie et al. `979 not only does not teach or even suggest the above discussed aspects and limitations of the present invention, but actually teaches away from the present invention in each aspect of the present invention and the prior art discussed above. It is, therefore, the belief and position of the Applicant that claims 21-27 are thereby fully and patentably distinguished over and from the teachings and suggestions of McKenzie et al. `979 under the requirements and provisions of 35 U.S.C. § 103. The Applicant therefore respectfully requests that the Examiner reconsider and withdraw all rejections of claims 20-27 over McKenzie et al. `979 under 35 U.S.C. § 103, and the allowance of claims 20-27 as amended herein.

If any further amendment to this application is believed necessary to advance prosecution and place this case in allowable form, the Examiner is courteously solicited to contact the undersigned representative of the Applicant to discuss the same.

In view of the above amendments and remarks, it is respectfully submitted that all of the raised rejection(s) should be withdrawn at this time. If the Examiner disagrees with the Applicant's view concerning the withdrawal of the outstanding rejection(s) or applicability of the McKenzie et al. 979 references, the Applicant respectfully requests the Examiner to indicate the specific passage or passages, or the drawing or drawings, which contain the necessary teaching, suggestion and/or disclosure required by case law. As such teaching, suggestion and/or disclosure is not present in the applied references, the raised rejection should be withdrawn at this time. Alternatively, if the Examiner is relying on his/her expertise in this field, the Applicant respectfully requests the Examiner to enter an affidavit substantiating the

Examiner's position so that suitable contradictory evidence can be entered in this case by the Applicant.

In view of the foregoing, it is respectfully submitted that the raised rejection(s) should be withdrawn and this application is now placed in a condition for allowance. Action to that end, in the form of an early Notice of Allowance, is courteously solicited by the Applicant at this time.

The Applicant respectfully requests that any outstanding objection(s) or requirement(s), as to the form of this application, be held in abeyance until allowable subject matter is indicated for this case.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,

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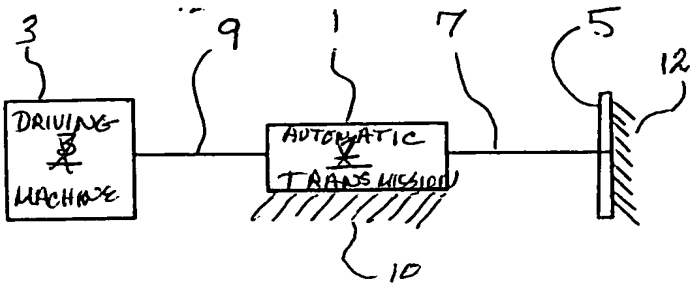

Fig. 1

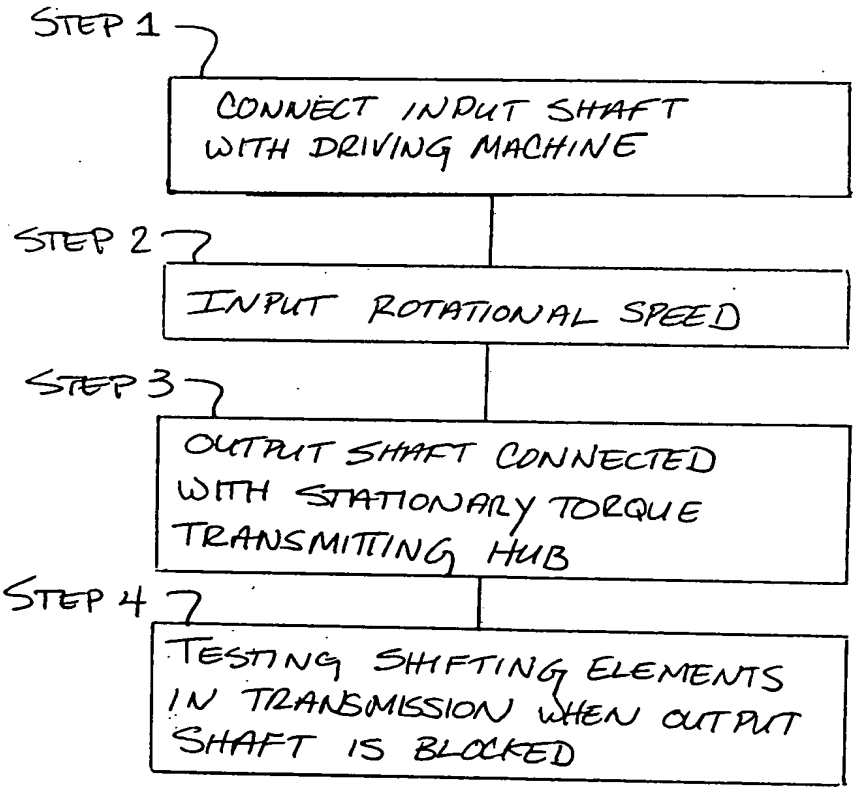

Fig. 2